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PALEONTOLOGY.—*A new* Callianassa *from the Cretaceous of South Dakota.*[1]

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In 1927 a number of fossil crustaceans collected by William L. Russell of the South Dakota Geological Survey were received through Dr. Carl O. Dunbar of the Peabody Museum of Yale University. They came from the Cretaceous of South Dakota and represent an undescribed species of *Callianassa*.

Callianassa cheyennensis, sp. nov.

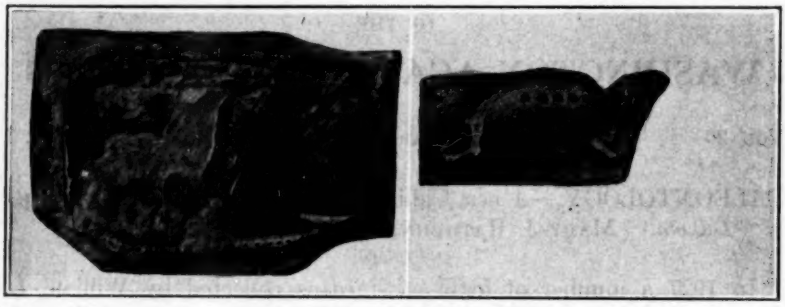
Type-locality.—Very top of Pierre shale and just below Fox Hills sandstone; collected along both banks of the Missouri River at several points between the mouth of the Cheyenne River and the Cheyenne Agency; 17 fragmentary specimens showing portions of the chelae. Type in the Geological Museum at the University of South Dakota at Vermillion.

Measurements.—Propodus of left cheliped, holotype, length to end of finger 14.6, length to sinus between fingers 10, greatest height 10.6, distal height of palmar portion 9.2 mm.

Description.—The type-specimen (Fig. 1) shows the inner face of a propodus of a left and probably major cheliped. Palm short and high, the greatest height equal to the length through the middle. Upper margin straight or a little convex, rounding down at each end. Proximal end not exactly at right angles to upper margin but forming a slightly acute angle. Considering the upper margin as horizontal, the lower margin after rounding down from the proximal end slopes gradually upward to the tip of the finger. Surface nearly flat. Finger (propodal) narrow, its base less than a third the height of the distal end of the palm; from the base it narrows rapidly to a slender extremity and curves gradually upward. On the inner surface of the hand there is, close to the lower margin, a row of hair sockets of which 27 can be made out; this does not include a few that may be at the proximal end. On the upper margin the sockets are fewer and more distant but the number cannot be determined. On the inner surface near the margin of the finger there is a curved row of three small distant sockets; the two distal of these are paired by a socket higher up, either on or just over the finger edge. At the distal end of the palm near the sinus between fingers there are two large sockets,

[1] Received November 18, 1929.

much larger than any others. A little below the upper margin in a straight line not quite parallel with the margin, but sloping a little downward distally to the condyle articulating with the dactylus, there is a row of linear spaced sockets of which about 9 can be made out. A few more sockets are scattered over the inner surface.



Callianassa cheyennensis.

FIG. 1. Inner view of propodus of left cheliped, × 3. Holotype.

FIG. 2. Inner view of dactylus of right cheliped, × 4. Paratype.

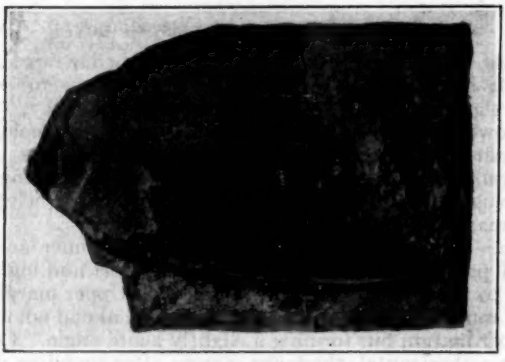


FIG. 3. *Callianassa cheyennensis.* Paratype.
Outer view of propodus of right cheliped, × 4.

The paratype (Fig. 3) is a right palm with the outer surface exposed. If, as I assume, it is the same species as the holotype, it is a minor chela of a larger specimen. The upper portion is broken off, the outer surface is convex from top to bottom and the inner is flat. Parallel to the lower margin outside there is a row of rather large well separated sockets 12 of which are visible, running on to the finger. A large socket near the sinus between the fingers is by far the largest of a series of 5 which follow the line of the propodal finger; and on the edge there is a row of small, evenly spaced sockets at least 7 in number. Below the middle of the palm there are 5 or 6 distant fair-sized sockets making 2 subparallel oblique lines. On the distal edge of the palm between the fingers there is a strong tuberculiform tooth pointing distad.

The movable finger (Fig. 2) belongs to a right chela, perhaps to the propodus just described, near which it lies; it is very thick, upper surface broad, upper margin convex except for a deep transverse sinus which embraces the articulating condyle. Two sockets transversely placed on upper surface not far from sinus. On inner surface just below upper margin there is a row of 5 prominent oblique sockets. Further down at the middle two small sockets are disposed longitudinally; 2 sockets on lower surface and a broad triangular subbasal tooth. The thin prehensile edge is nearer the outer surface; it, as well as the tip, are incomplete.

Affinity.—The specimens have been compared with 3 specimens of *C. whiteavesii* Woodward[2] from Sounding Creek, N.W. Territory. In this species the palm is definitely longer than wide, its proximal end is at right angles to both upper and lower margins, although the latter begins to slope upward at about the middle of its length, making the proximal half of the palm higher than the distal half. None of the specimens show the inner surface. The outer surface is less convex than in *cheyennensis*, its upper edge thin and not bent over so far on to the inner side. A smooth, blunt ridge runs inward from the upper edge of the propodal finger and fades out about half way along the palm. The surface below this is flattened or a little concave. In the new species this surface is evenly convex. Close to the upper edge in *whiteavesii* there is a row of lengthwise punctae 12 of which can be made out. Near and parallel to the proximal end, a row of 6 punctae, visible on the counterpart of Woodward's fig. 2*b;* and a row of 3 punctae arranged lengthwise and slightly obliquely at the middle of the palm and pointing toward the upper edge of the propodal finger (on the counterpart only of fig. 2*b*). The fingers are of about equal size. On the original of Woodward's fig. 2*a* there is a large, depressed, transverse socket on the palm near and parallel to the dactylus.

BOTANY.—*Botanical notes on, and descriptions of, new and old species of Venezuelan plants.*—III. *Old and new species of Euphorbiaceae* (*Conclusion*).[1] H. PITTIER, Caracas, Venezuela.

Croton redolens Pittier, sp. nov. (Sect. *Eluteria*)

Arbuscula redolens, aromatica, coma depressa, ramis contortis, nodosis, glaberrimis, cortice griseo tectis, ramulis novellisque dense fulvo-tomentosis; foliis alternis, petiolatis, membranaceis, petiolis laminis 2–3-plo brevioribus, teretibus, tomentellis, apice 2–7-glandulosis, glandulis brevissime stipitatis, laminis late ovatis, subcordiformibus, basi leviter emarginatis rotundatisve, 5–7-nerviis, apice acutatis obtusiusculis, supra velutinis vel praeter nervis parce stellulatis, subtus dense cano-tomentellis, marginibus plus minusve sinuato-dentatis, dentibus villosulis; stipulis inconspicuis; racemis terminalibus axillaribusve, pedunculatis, rhachi anguloso, longitudinaliter sulcato, fulvescente-tomentello; bracteis inconspicuis; floribus flavescentibus virescentibusve, pedicellatis, haud congestis, foemineis remotis 1–3 basalibus, masculinis 1–4-fasciculatis, cito deciduis; *flor. foem.*: pedicello crasso calyce subaequante, calyce haud accrescente extus tomentoso intus

[2] Geol. Mag. n. s. 7: 435. *pl. 17, fig. 2.* 1900.

[1] The two first contributions on new and old species of Venezuelan plants appeared in THIS JOURNAL 19: 175–186 and 351–357. 1929. Received November 15, 1929.

parce stellulato, pilis bombycinis, segmentis ovato-lanceolatis obtusis; petalis lineari-lanceolatis, villosis, calyce brevioribus; ovario dense tomentello, stylis semel dichotomi, cruribus denticulatis, basi parce stellulatis; *flor. masc.:* pedicello gracili calyce subbreviori, calycis segmentis ovato-oblongis, obtusis, tomentosis; petalis ovato-oblongis, obtusis, utrinque villosulis; receptaculo bombycino-villoso; staminibus 15–17, glabris; capsula pedicellata, subglobosa, trisulcata, extus dense stellulato-tomentosa; seminibus carunculatis, laevibus, oblique transverse-sulcatis.

Arbuscula 2–3 m. alta, basi ad 12 cm. crassa. Petioli 0.8–3.5 cm. longi; laminae 2.5–8 cm. longae, 1.5–6 cm. latae. Racemi 4–10 cm. longi, pedunculis 2–2.5 cm. *Flos masc.:* pedicelli sub-2 mm. longi; calycis segmenta ex centrum 2–2.5 mm. longa, 0.8–1.2 mm. lata; petala circa 1.5 mm. longa, 0.5–0.8 mm. lata. *Flos foem.:* pedicelli plus minusve 5 mm. longi; calycis segmenta ex centrum 4–4.7 mm. longa, basi 1.5–1.8 mm. lata; petala 1.8–2.5 mm. longa, 0.1–0.4 mm. lata. Capsula 4–7 mm. longa; semina 2–5 mm. longa.

FEDERAL DISTRICT: On arid hills near Las Trincheras, 900 m.; Tacagua valley, on the old cart-road from Caracas to La Guaira, forming small groves: flowers and fruits September 6, 1925 (*Pittier* 11886, type); other collections, same locality *Pittier* 10250 (var. *parvifolia*), 10254 (var. *velutina*).

The female flowers are always distinctly 5-petalous, so that this interesting species has to be placed in Section *Eluteria*, where it has so far no nearly related Venezuelan ally. It presents itself in at least three distinct varieties: the typical one (var. **genuina** Pittier, var. nov.); another with larger leaves velvety on the upper face (var. **velutina** Pittier, var. nov.); and a third, the tree more twisted and gnarled, the leaves also tomentellose on both faces, but much smaller, biglandular or the glands obsolete (var. **parvifolia** Pittier, var. nov.).

All parts of the tree, the leaves especially, have a very aromatic, pungent smell, and are used as a home medicine. Vernacularly, the plant is known as *Sangredrago*, a name which applies to the arborescent species of *Croton* generally.

Croton anomalus Pittier, sp. nov. (Sect. *Decarinium*)

Arbuscula ramis glabris glabrescentibusve, ramulis parce adpresseque stellulato-pubescentibus: foliis alternatis, membranaceis, breviter petiolatis, basi eglandulosis, petiolis teretibus, adpresse pubescentibus indumento stellulato pilis paucis erectis longioribus intermixto, laminis ovalibus ovato-lanceolatisve basi rotundatis, leviter emarginatis, quintuplinerviis apicem versus sensim angustatis et abrupte cuspidatis, marginibus irregulariter sinuatis, dentatis serrulato-dentatisve, supra pilis simplicibus parcissime hirtis vel glabrescentibus asperulisque, subtus dense cano-tomentellis; stipulis elongatis, lanceolato-linearibus, pubescentibus; racemis terminalibus, rhachi pubescente; bracteis linearibus, stellulato-villosis, persistentibus; floribus foemineis 1–3 sessilibus subsessilibusve, calycis segmentis 6 (interdum 7) ovalibus, obtusiusculis, valde inaequalibus, 4 anteriores reliquis majoribus, supra obscure viridis stellulato-puberulis, subtus cano-tomentellis; ovario dense fulvo-hispido, stylis ter-dichotomis, cruribus gracilibus, villosis, supremis brevibus; floribus masculis numerosis caducissimis pedicellatis, foemi-

neis minoribus; pedicellis gracilibus, calycis segmentis late ovalibus, obtusis, tenuiter membranaceis, venulosis, atque receptaculo utrinque villosis; petalis calycis segmentis paullo longioribus, obvato-spathulatis, longe angusteque unguiculatis, utrinque villosulis; staminibus 16, filamentis villosis; capsula ignota.

Arbuscula ad 2 m. alta. Petioli 0.6–1.2 cm. longi; laminae 3–6.5 cm. longae, 1–2.7 cm. latae. Stipulae 0.8–1 cm. longae. Racemi 5–7 cm. longi; bracteae circa 3 mm. longae. *Flos masc.:* pedicelli 1.5–2.5 mm. longi; calycis segmenta ex centrum 4 mm. longa, 1.8–2.4 mm. lata; petala 4 mm. longa, 1.2–1.6 mm. lata. *Flos foem.:* calycis segmenta majores ex centrum 6.5–7.2 mm. longa, 2.8–3.8 mm. lata.

LARA: Los Rastrojos, between Sarare and Barquisimeto, in bushes; flowers April 9, 1925 (*Pittier* 11757, type).

This species departs from all the other species of *Croton* found heretofore in Venezuela in the 6–7 calycinal segments, 4 of which are manifestly larger than the 2 remaining ones. Though I am aware that its relationship to *C. glandulosus* and *C. chamaedryfolius* is very remote, I have placed it provisionally in Section *Decarinium*.

Croton timotensis Pittier, sp. nov. (Sect. *Decapetalon*)

Arbuscula tronco ramisque in aetate glabrescentibus, ramulis teretibus villoso-tomentosis pilis simplicibus fulvescentibus; foliis modice petiolatis, membranaceis, petiolis canaliculatis dense stellulato-tomentosis apice pauci-(2–6-) glandulosis, laminis ovato-cordiformibus basi late emarginatis subtruncatisve (3–)5–(7)-nerviis, apice longe cuspidatis, margine dentatis, supra praeter nervis stellulato-puberulis glabrescentibus minute tuberculatis, subtus dense estellulato-tomentosis, pilis fulvescentibus; stipulis setaceis, stellulato-villosis; racemis elongatis, remotifloribus, rhachi pedicellisque dense tomentellis, bracteis lineari-subulatis; floribus 4–6-fasciculatis; *foemineis* subsessilibus interdum solitariis, calycis segmentis anguste oblongis, obtusis, extus tomentellis, glandulis atris substipitates alternantibus; ovario fulvo-tomentoso, stylis semel dichotomis, cruribus basi parce stellulatis; calycis segmentis *florum masculorum* late ovatis, obtusis, extus fulvo-tomentosis; petalis 10, calycis segmentis brevioribus, lanceolatis, basi longe attenuatis glabris, apice ciliatis; receptaculo villoso; staminibus 39–51, filamentis villoso-tomentosis; capsula ovoidea, extus parce stellulata; seminibus laevibus, carunculatis.

Arbuscula usque ad 2.5 m. alta. Petioli 1.5–5 cm. longi; laminae 4–11 cm. longae, 2–5 cm. latae. Stipulae 3–4 mm. longae. Racemi 15–22 cm. longi; pedicelli florum masculorum circa 4 mm. longi; bracteae 4–5 mm. longae. *Flos masc.:* calycis segmenta ex centrum 4–4.5 mm. longa, 2–2.5 mm. lata; petala 3–4.2 mm. longa, 0.9–1.6 mm. lata. *Flos foem.:* calycis segmenta ex centrum 5–6.5 mm. longa, 1.1–1.6 mm. lata. Capsula circa 6 mm. longa; semina 4.5–5.5 m. longa.

MÉRIDA: Vicinity of Timotes, 2000 m., in bushes along river; flowers and fruits January 20, 1928 (*Pittier* 12646, type).

This species is a most interesting addition to the flora of Venezuela, being the first and only representative of Section *Decapetalon*, which according to Muell.-Arg. comprised heretofore only 3 species, 2 in the Tropics of Asia and Africa and another in Southern Brazil.

Croton confusus Pittier, sp. nov. (Sect. *Eucroton-Eutropia*)

Arbor elegans, trunco erecto, cortice griseo tecto, coma elongata, ramis vestutis glabrescentibus, juveniis dense rufo-tomentellis, pilis stellulatis; foliis submembranaceis, imprimis utrinque stellulato-tomentosis, indumento subtus petiolorumque densius et canescente, in aetate utrinque glabrescentibus nervibus supra subtusque prominentibus, venulis reticulatis subtus prominulis; petiolis elongatis, gracilibus vix sulcatis, laminis amplis, integris trilobatisve, basi leviter emarginatis biglandulosis, glandulis magnis sessilibus, lobis acuminatis, saepe sublobulatis, margine sinuato-dentatis, dentibus glandulosis; stipulis setaceis, caducissimis; racemis foliis brevioribus rhachi dense stellulato-tomentoso; bracteis inconspicuis, ovatis, villosis; floribus luteis 6–9-fasciculatis, masculis foemineisque inmixtis, pedicellatis; pedicellis masculis calyce subduplo longioribus, foemineis brevioribus; calycis masculi segmentis ovatis, obtusis, extus dense stellulato-tomentosis intus receptaculoque tomentosis pilis simplicibus; petalis lanceolatis obovato-spathulatisve, tomentosis, calycis segmentis longioribus; staminibus 24, glabris; calycis foeminei segmentis oblongis, apice acutatis, obtusis; disci glandulis majusculis; ovario dense fulvo-hirsuto, pilis simplicibus; stylis e basi divisis, fere glabris, cruribus apice breviter bilobulatis, lobulis latis obtusis. Capsula non vidi.

Arbor ad 20 m. alta, basi 40 cm. crassa. Petioli 4–14 cm. longi, laminae 7–22 cm. longae, 3.5–16.5 cm. latae. Racemi 12–16 cm. longi; pedicelli florum masc. 4–6 mm., foemin. circa 2 mm. longi. *Flos masc.:* calycis segmenta ex centrum circa 4 mm. longa, 2.2 mm. lata; petala 4.5–5 mm. longa, 1–1.5 mm. lata. *Flos foem.:* calycis segmenta ex centrum circa 5 mm. longa, 1–2 mm. lata.

YARACUY: Forested hills around Iboa near San Pablo, at an altitude of 450 m.; flowers January 2, 1929 (*Pittier* 13077, type).

Confused at first with *Croton gossypiifolius* Vahl, it differs in the number of stamens, which was found to be 24 in all the flowers examined; in the contexture of the leaves almost invariably with two large glands at the base and with small yellow glands on the margin; in the yellow flowers; and in several other good characters. The vernacular name is *Sangrito*.

Croton caracasanus Pittier, sp. nov. (Sect. *Eucroton-Cleodora*)

Arbor parva vel mediocris, ramis glabrescentibus, ramulis plus minusve lepidotis; foliis alternis, membranaceis, opacis, modice petiolatis, petiolis gracilibus, anguste canaliculatis, parce lepidotis, apice hirtellis superne biglandulosis, inferne hirtellis, glandulis sessilibus crateriformibus; laminis ovalibus, basi rotundatis 5-nerviis, apicem versus acutatis, margine irregulariter grosse serrato-dentatis, utraque pagina stellulato-lepidotis, lepidibus haud contiguis, supra obscure viridis, subtus pallidioribus nervis vix prominulis basi hirtellis; stipulis inconspicuis; racemis elongatis, rigidis, remotifloris, saepe unisexualibus; basi saepe bracteis 2, foliaceis alternis suffultis; rhachi gracili, anguloso, densius lepidoto; bracteis inconspicuis; floribus parvis, numerosis, *foemineis* sessilibus, vulgo solitariis interdum binis; calyce breviter tubuloso, lepidoto, segmentis ovatis, obtusiusculis; ovario cano-tomentoso, stylis bifidis, cruribus crassis, subciliatis; *floribus masculis* breviter pedicellatis, calycis segmentis late ovatis, extus tomentellis; petalis calyce subaequantibus, extus glabris, intus receptaculoque bombycinis, margine dense cano-tomentellis; staminibus 14–16; capsula depressa, trisulcata, parce stellulato-lepidota.

Arbor usque ad 12 m. alta, basi 35–40 cm. diam., vel saepe arbuscula depressa 2–3 m. alta. Petioli 1.5–4 cm. longi; laminae 5.5–12 cm. longae, 3–7.5 cm. latae. Racemi 10–22 cm. longi. *Flos masc.:* pedicelli 1–1.5 mm. longi; calycis segmenta ex centrum 2.3–3 mm. longa, 1.7–1.9 mm. lata. Petala 2.4–3 mm. longa, 0.9–1.2 mm. lata. Calyx foemineus circa 2.5 mm. longus, segmentis 1.4–2 mm. longis, 0.9–1.3 mm. latis. Capsula 8 mm. longa, circa 10 mm. lata.

LARA: Vicinity of Duaca; flowers July 1925 (*Saer d'Héguert* 276, type). FEDERAL DISTRICT: Catia de los Frailes near Caracas, on rocky slopes; flowers and fruits December 21, 1923 (*Pittier* 11289); Chacaíto Gorge, in forest; flowers August 24, 1923 (*Pittier* 11131).

This species, which seems to be very variable in size, is not uncommon on the wooded hills with southern exposure and in the cool gorges around Caracas. I do not think to be mistaken in placing it in Series *Argyrocroton*, Subsect. *Cleodora* of Sect. *Eucroton*, although the two other Venezuelan species of that Series, *C. orinocensis* and *C. multicostatus* differ in the habit, in the glandless leaves and in the twice divided styles. *C. caracasanus* would come near to *C. stenotrichus* Muell.-Arg. In Lara, it is known vernacularly as *Sangre de drago* and *Cáscara amarga*.

Croton multicostatus Pittier, sp. nov. (Sect. *Eucroton-Cleodora*)

Arbor parva vel mediocris, ramulis crassis creberrime subferrugineo-lepidotis, in aetate glaberrimis; foliis magnis, coriaceis, integerrimis, modice petiolatis, petiolis teretibus, anguste canaliculatis, lepidotis, lepidis haud contiguis, laminis late ovatis, basi emarginatis, eglandulosis, apice vulgo late rotundatis, supra primum praeter costam nervosque dense stellulato-hirsutis parce stellulatis, demum glaberrimis, subtus primum utrinque densissime lepidotis, mox glabrescentibus glabrisve, costa venisque 12–15 parcissime stellulato-lepidotis; stipulis lineari-lanceolatis, lepidotis, cito deciduis; racemis terminalibus densifloris haud bene evolutis, rhachi alabastrisque lepidotis; bracteis masculis 3-floris, lepidoto pubescentibus late triangularibus, concavis, unilateraliter lobulatis, lobulo triangulari; petalis oblongis, obtusiusculis, extus minutissime puberulis, intus glabris, margine dense ciliatis; receptaculo villoso; staminibus 11–12, filamentis basi barbatis; bracteis foemineis masculis majoribus, unifloris, intus glabris; calyce foem. subtubuloso, segmentis ovatis, acutis, extus lepidotis, intus plus minusve villoso-tomentosis; ovario dense rufo-villoso, stylis bis vel ultra dichotomis; et caetera ignota.

Arbor 8–12 m. alta. Petioli 4–5 cm. longi; laminae 9–19 cm. longae, 6–14 cm. latae. Stipulae 1.2–2 cm. longae, 2–3 mm. latae. Bracteae foem. ad 1 cm. longae, masc. 0.5 cm. longae. Calyx foem. circa 1.2 cm. longus, lobulis 0.5 cm. longis, 2.5–3 cm. latis.

CARABOBO: Hacienda de Cura, 900 m., in forests; in bud August 15, 1918 (*Pittier* 8013, type).

This fine species, of which we unfortunately have only imperfect specimens, belongs undoubtedly to Series *Argyrocroton*, Subsect. *Cleodora* of Section *Eucroton* (*Medea*). The scales are of the same type as those of the Brazilian *Croton migrans* Casaretto. The most striking character, which this species has in common with *C. umbratilis* H.B.K., consists in the unusually large

number of primary veins; the size and glabrescence of the mature leaves are also unusual in the Venezuelan species. The tree is known locally as *Torco*.

Until more complete information is obtained, we assign to this species our No. 11948, also imperfect, with unripe capsules. It differs from the typical *C. multicostatus* mainly in the oval-lanceate leaves. The scales of the petioles also seem to be smaller, with indistinct rays. The young capsules are obovoid, 13–15 mm. long and scaly furfuraceous, the seeds 11 mm. long, smooth and with a sessile caruncula. The calyx is persistent, but apparently not accrescent. The tree is a large one with a trunk not less than 4 m. up to the main limbs and about 50 cm. in diameter. In the valley of Caruao (Federal District) whence our specimens come, it is known as *Sarasaro*.

Croton grossedentatus Pittier, sp. nov. (Sect. *Eucroton-Cleodora*)

Frutex humilis, trunco ramis vestutis glabris glabrescentibusve, ramulis squamuloso-stellulatis, novellis petiolis racemorum rhachidibusque dense hirto-tomentosis; foliis membranaceis, modice petiolatis, basi eglandulosis 7-nerviis, petiolis leviter canaliculatis, laminis oblongo-ovatis basi cordiforme emarginatis, apice sensim acuminatis acutissimis mucronulatis, marginibus fere e basi grosse serrato-dentatis, dentibus serrulatis apicibus glanduloso-mucronulatis, supra obscure viridis parce stellulatis, subtus cano-tomentosis costis nervibus venulisque transversalibus prominentibus; stipulis linearisetaceis, stellulato-pilosis; racemis brevibus axillaribus terminalibusque, basi floribus foemineis 2–4 breve pedicellatis, apice floribus masculis cito caducis gerentibus; bracteis parvis, hirsutis, caducissimis; floribus parvis; *foemineis:* calyce persistente, segmentis oblongo-acuminatis, extus dense fulvo-tomentosis, intus glabris; ovario fulvo-hirsuto, stylis sub-4-partitis, cruribus gracilibus, saepe bifidis, fere ad apicem villosis; floribus *masculis* foemineis minoribus, calycis segmentis oblongis, apicem obtusem versus angustatis; receptaculo villoso; staminibus 12, exsertis, filamentis glabris; capsulis obovoideis, extus cano-villosis, indumento stellulato in aetate depauperato; seminibus ovalibus, caruncula tis, laevibus, brunneis.

Frutex usque ad 1.50 m. alta. Petioli 1–5.5 cm. longi; laminae 6.5–12 cm. longae, 3.5–6 cm. latae. Stipulae 8–10 mm. longae. Racemi 2.5–4.5 cm. longi. *Flos masc.:* pedicelli 3 mm. longi, calycis segmenta ex centrum 2.7–3.2 mm. longa, 1.2–1.4 mm. lata. Petala 2.8–3.3 mm. longa, 0.5–1 mm. lata. *Flos foem.:* pedicelli 2–3.5 mm. longi, calycis segmenta e basi 5.5 mm. longa (longitudino calycis 7 mm.), plus minusve 2.5 mm. lata. Capsula 6–7 mm. longa; semina circa 3.5 mm. longa

LARA: On arid hills along the road between El Tocuyo and Humocaro Bajo; flowers and fruits, January 6, 1929 (*Pittier* 13105, type).

Related to *C. populifolius* Mill. through the mode of division of the styles and the number of stamens but differs in the eglandular calyx, in the serrature of the leaves, and the simply subulate stipules. From *C. urticaefolius* Lam. it is distinguished by the number of stamens (12 instead of 9–11), the glabrous filaments, and also the shape of the leaves and the eglandular stipules.

Croton truxillanus Pittier, sp. nov. (Sect. *Eucroton-Cleodora*)

Frutex vel arbuscula ramulis novellisque sordide pubescentibus, foliis alternis, breviter petiolatis, membranaceis, sub-3-plinerviis, petiolo sordide pubescente laminis 5–7-plo breviori, apice biglanduloso, laminis ovatis, basi cuneatis apice breviter acuminatis, supra pubescentibus cinereo-viridisque, in aetate glabrescentibus, subtus dense cano-tomentosis, pilis omnium stellatis, marginibus obscure denticulatis; racemis terminalibus, elongatis, basi floribus foemineis 2–7 subsessilibus, apice floribus masculis dense congregatis gerentibus, rhachi gracili tomentoso; bracteis triangulari-lanceolatis, tomentosis, foemineis 1-, masculis 1–3-floris; *floribus foemineis:* calyce persistente, segmentis ovato-triangularibus, obtusiusculis, extus dense tomentosis, intus glabris: petalorum rudimentis conspicuis, glanduliformibus: ovario dense flavescente-tomentoso, stylis bifidis, basi glabris, cruribus gracilibus, stellato-pilosulis; *floribus masculis:* calycis segmentis late ovatis obtusis, extus tomentosis, intus glabris; petalis oblongo-linearibus, obtusis, basi villosis, calyce longioribus; receptaculo villoso-tomentoso; staminibus 15–17, filamentis basi villosis; capsulis subovoideis, extus dense stellulato-tomentellis; seminibus oblongo-ovoideis, minute carunculatis, lucidis, biseriatim oblique undulato-costatis.

Frutex vel arbuscula 0.50–3-metralis. Stipulae triangulares, inconspicuae, 1–3 mm. longae. Petioli 0.6–2 cm. longi; laminae 5–12 cm. longae, 2–5 cm. latae. Racemi 6–12 cm. longi. Bracteae 3–4 mm. longae. *Flos masc.:* calycis segmenta ex centrum 3 mm. longa, circa 1.5 mm. lata; petala 2.5 mm. longa, 0.5–0.7 mm. lata. *Flos foem.:* calycis segmenta ex centrum 3.5–4 mm. longa, basi 1–1.2 mm. lata. Capsula circa 4 mm. longa; semina 3.5 mm. longa, 2 mm. lata.

TRUJILLO: El Dividive, in scattered savanna groves; flowers and fruits November 27, 1922 (*Pittier* 10820, type); Loma del Morón, near Valera, in bushes; flowers November 18, 1922 (*Pittier* 12723, 12725); Mendoza, on steep, arid hills; flowers January 19, 1928 (*Pittier* 12627).

So far this species has been collected only in State Trujillo, where it seems to be rather common and is known as *salvia muñeca* and *punta de lanza*. It looks very much like *Croton rhamnifolius* H.B.K., but differs in the obliquely grooved seeds, in the shape and dimensions of the calyx and in the rudimentary petals in the female flowers.

Croton dolichostachyus Pittier, sp. nov. (Sect. *Eucroton-Cleodora*)

Arbuscula vel arbor parva, ramulis sordide pubescentibus, apice ramorum congregatis subverticillatisve; foliis magnis mediocrisve, longe petiolatis, membranaceis, discoloribus; petiolis crassis, canaliculatis, fulvo-pubescentibus, laminis 3–4-plo brevioribus; laminis ovato-lanceolatis, basi breviter 3-nerviis, obsolete 3–4-glandulosis, cuneatis subrotundatisve, apice breviter acuminatis, supra punctulatis parce pilosulis, subtus densius stellato-pubescentibus tomentosisve sordide canescentibus, marginibus minute serrulatis; stipulis obsoletis; racemis longissimis, remotifloris, rhachi pubescente, anguloso, sulcato; bracteis triangularibus apiculatis; *flos foem.:* bracteis 1-floris, floribus sessilibus, numerosis, calyce extus tomentello, intus glabro, segmentis lineari-triangularibus, angustis, apice obtusiusculis; ovario dense rufo-tomentoso; stylis profunde bifidis, cruribus longissimis, apice saepe clavatis, parcissime stellulato-pilosulis; *flos masc.:* bracteis 2–5-floris, floribus breviter

pedicellatis; calyce dense stellulato, segmentis ovato-acuminatis; petalis linearibus, calyce subaequantibus, basi bombycino-barbatis; receptaculo villoso; staminibus circa 20; filamentis glabris; capsula ovoidea, extus dense rufo-stellulata.

Arbuscula usque 3-metralis. Petioli 2–7 cm. longi; laminae 12–16 cm. longae, 3.5–7.5 cm. latae. Racemi 18–30 cm. longi. Bracteae 2.5–4.5 mm. longae. *Flos masc.:* pedicelli circa 2 mm. longi; calycis segmenta ex centrum 2.5–3 mm. longa, 1.3–1.6 mm. lata; petala 2.2–2.6 mm. longa, 0.5–0.9 mm. lata; *flos foem.:* calycis segmenta ex centrum 3–3.5 mm. longa, basi 0.5–1 mm. lata; stylorum crures ad 4 mm. longa. Capsula circa 4 mm. longa.

LARA: Between Corora and Trentino, common on valley flats; flowers January 16, 1928 (*Pittier* 12616, type). ZULIA: Near Mene Grande, in bushes; flowers and fruits November 2, 1922 (*Pittier* 10651).

Belongs to the group of *Croton rhamnifolius*, from which it differs mainly in the much longer petioles, in the very long racemes, in the shape of the petals and in the number of stamens.

CROTON FERRUGINEUS H.B.K. Nov. Gen. & Sp. **2**: 77. 1817 (Sect. *Eucroton-Cleodora.*)

Arbuscula ramis elongatis cortice griseo tectis, ramulis, novellis rhachibusque densius stellato-ferrugineis; foliis parvis, breviter petiolatis, membranaceis, peninerviis, petiolis ferrugineo-hirsutis, laminis circa 5-plo brevioribus; laminis ovalibus, basi rotundatis biglandulosis, apice late obtusis mucronulatis, margine minute denticulatis, supra parce subtus densius sordideque stellatis, costa venisque subferrugineis subtus prominulis; stipulis nullis vel inconspicuis; racemis brevibus subdensifloris, rhachi anguloso; bracteis parvis triangularibus, acutis, hirsutis, persistentibus, marginibus glandulosis; *flos foem.:* bracteis unifloris, floribus sessilibus, calycis segmentis ovato-lanceolatis, subacutis, utrinque flavescenti-hirsutulis; petalorum rudimentis conspicuis, brevibus, glanduliformibus; ovario densius fulvescente stellato-hirsuto; stylis fere usque ad basin bifidis, cruribus parce stellato-pilosiusculis; *flos masc.:* bracteis 1–3-floris, floribus breviter pedicellatis; calycis segmentis ovato-lanceolatis, obtusiusculis, extus dense villosis; petalis obovatis, spathulatisve, sepalis longioribus, unguiculo elongato, angusto, margine longe barbato; receptaculo villoso; staminibus 14–19, filamentis basi villosis; capsula parva, ovoidea, dense stellato-pubescente; seminibus carunculatis, lucidis, minutisime rugulosis.

Petioli 5–10 mm. longi; laminae 2.5–4 mm. longae, 0.9–2 cm. latae. Racemi 5–8 cm. longi. Bracteae circa 1 mm. longae. *Flos masc.:* pedicelli 2–5.5 mm. longi; calycis segmenta ex centrum 2.7–3 mm. longa, circa 1.3 mm. lata; petala 2.7–3 mm. longa, circa 1 mm. lata. *Flos foem.:* calycis segmenta ex centrum 3–3.4 mm. longa, 0.7–1.1 mm. lata. Capsula 6 mm. longa; semina 5 mm. longa.

MÉRIDA: Páramo del Morro, 2500 m.; flowers and fruits April 1st, 1922 (*Jahn* 1063; redescription based on this).

It is difficult to distinguish *Croton ferrugineus* from the several varieties of *C. flavens* L. Jahn's specimen, however, seems to correspond closely to the description of the first species, differing only in the smaller leaves, the larger calyx and also in the presence of glandular rudiments of petals in the pistil-

late flower, a detail which may have escaped to the original observer. From *C. flavens* it differs in that the primary veins emerge from the costa at an acute, not nearly right angle; also in the shape of the basal glands, in the caducous female calyx, in the styles divided nearly from the base, and in the shape and indumentation of the male petals.

Julocroton acuminatissimus Pittier, sp. nov. (Sect. *Oligonychia*)

Frutex elatus, ramis ramulis angulosis petiolisque dense sordideque stellulato-pubescentibus; foliis membranaceis, petiolis teretibus, laminis 6–7-plo brevioribus; laminis ovato-lanceolatis, basi latioribus, 3–7-nerviis, rotundatis, obsolete biglandulosis, apice longissime gradatim acuminatis, marginibus irregulariter denticulatis, supra viridis crebre minuteque stellulatis, subtus dense stellulato-pubescentibus; stipulis lineari-setaceis, integris, stellulato-pilosulis; inflorescentiis subcapituliformibus, apice ramulorum congestis; spicis breve pedunculatis basi bibracteatis, rachidibus pubescentibus; bracteis foliaceis, bracteolis unifloris, lineari-setaceis, pilosulis; *flos masc.* non evolutus; *flos foem.:* pedicellis brevibus, sepala utrinque stellulato tomentosis, 3 anterioribus magnis, ovato-lanceolatis, pinnatisectis, 2 posterioribus minoribus, integris, setaceo-linearibus; disci glandulis 3 anterioribus cohaerentibus, subacutis, glabris, posterioribus obsoletis; ovario globoso, stellato-tomentoso, stylis bis dichotomis, cruribus longissimis, tenuibus, pilosis. Et caetera ignota.

Frutex usque ad 2 m. altus. Petioli 0.7–1.5 cm. longi; laminae 4.5–10 cm. longae, 2–7 cm. latae. Stipulae 1–1.5 cm. longae. Pedunculi primarii 7–8 cm., secundarii (spicarum) 0.5–2 cm.; pedicelli florum foeminorum usque ad 0.5 mm. longi. Bracteae 2–2.5 cm., bracteolae 0.8–1.2 cm. longae. Sepala majora circa 9.5 mm. longa, 4.5–5 mm. lata. Styli plus minusve 7 mm. longi.

YARACUY: Between La Piedra and Yaritagua, in bushes; flowers September 18th, 1923 (*Pittier* 11175, type).

Belongs to Sect. *Oligonychia*, and is perhaps closely allied with *Julocroton montevidensis* Muell.-Arg., differing mainly in the very long acuminate leaves with shorter petioles, and in the less divided styles.

Manihot filamentosa Pittier, sp. nov.

Arbuscula glaberrima, trunco brevi, ramoso, brunneo, ramis cinereis, efoliatis, ramulis glaucescentibus, stipulis parvis, lanceolatis subulatisve, apice plus minusve denticulatis, deciduis; foliis apice ramulorum congestis, longe petiolatis, membranaceis, petiolis gracilibus, laminis vulgo longioribus, purpurascentibus, laminis plus minusve ovato-reniformibus, fere ad basin 5-lobulatis, basi late emarginatis minute bistipellatis, supra obscure viridis, subtus glaucescentibus, reticulatis, costis prominentibus venis venulisque vix prominulis, lobis penninerviis, sinuato-lyratis, lobulis apice plus minusve rotundatis, longe acuminatis acutissimis, exterioribus interdum auriculatis, saepe integris; stipellis subulatis; inflorescentiis terminalibus, ramulosis, ramulis longe pedunculatis; floribus pedicellatis, virescentibus, pendulis; pedicellis basi 2-bracteolatis, bracteolis subulatis; *floribus masculis:* pedicellis longiusculis; alabastris ovoideis, angulosis; calyce campanulato, lobulis late ovatis, brevissime acutatis, marginibus introflexis; disci glandulis plus minusve

coalitis; staminibus 10, liberis, filamentis longissimis convoluto-flexuosis, 5 exterioribus longioribus, omnium glabris, antheris lineari-oblongis; *floribus foemineis* masculis majoribus; lobulis fere usque ad basin liberis, anguste lanceolatis, acuminatis, marginibus introflexis; discus annularis; ovario ovoideo, 6-carinato, glabro, stigmatibus brevibus biseriatim flabellatis; capsula globosa, pedicello apicem versus gradatim incrassato.

Arbuscula (fide Saer) 2–3 m. alta. Stipulae 4–6 mm. longae. Petioli 6–23 cm. longi; laminae 6–14 cm. longae, 9–15 cm. latae; lobulo mediano 6–13 cm. longo, 3.5–6 cm. lato, infimi 4–7.5 cm. longi, 2–3.5 cm. lati. Inflorescentiae partiales 10–12 cm. longae, pedunculi circa 7 cm., pedicelli 8–10 mm. longi; bracteolae 4 mm. longae. *Flos masc.:* calyx 10 mm. longus, lobulis circa 4.5 mm. longis, 4–4.5 mm. latis; filamenta longiora circa 15 mm., breviora 5 mm. longa; antherae bene evolutae 4–5.2 mm. longae. *Flos foem.:* calyx 9–11 mm. longus, lobulis 6.5–7.5 mm. longis, 2–3 mm. latis. Capsula (non bene evoluta?) 17 mm. longa, 18 mm. diam., pedicello 15 mm. longo.

LARA: Scattered in sandy thorn-bushes along the La Ruesga (mostly dry) River in the vicinity of Barquisimeto; flowers and fruits August 20, 1929 (*J. Saer d'Héguert* 366, type); same locality, flowers April 1925 (*same collector;* 191).

Closely allied to *M. carthagenensis* (Jacq.) Muell.-Arg., but differs in the description of the leaves, in the longer, denticulate stipules, and more especially in the stamens with very long filaments and elongate, almost linear anthers. I am indebted to Mr. Saer d'Héguert for several interesting details taken from the live plant and for the communication of the common name, *Yuca sibidigua.*

PROCEEDINGS OF THE ACADEMY AND AFFILIATED SOCIETIES

PHILOSOPHICAL SOCIETY

The 993d meeting was held in the Cosmos Club Auditorium, May 25, 1929.

Program: L. W. TILTON, *Variations in the optical density of glass.*—Most optical glasses are not sufficiently homogeneous to obviate compensatory figuring of the surfaces of certain highly corrected optical systems. These variations in the optical properties of good glass are matters of the fifth and sixth decimal places of index of refraction. They have been generally considered as due to unavoidable differences in chemical composition. It has, however, been shown by Tool and others that the properties of glass, as measured at ordinary temperatures, are dependent on the character of the heat treatments to which the glass has been subjected. Some quantitative relationships between refractive index and effective annealing temperature have been recently determined. Furthermore, in the case of a barium flint glass, 90% of the existing optical heterogeneity was removed by special reannealings under iso-thermic conditions.

It is now of interest to inquire as to whether the uniformity of optical glass in general may be improved by more careful annealings. Local variations in the index of refraction of samples from six types of optical glass were measured by a prism method and the corresponding index gradients were computed. The values so obtained for these specimens of ordinary crown,

medium flint, and dense flint were, respectively, 0.6, 2.4, and 2.3 $\times$ 10^{-6} per cm. They were all lower than the gradients found in borosilicate crown, light barium crown, and dense barium crown, *viz.*, 4.9, 3.1, and 3.7 $\times$ 10^{-6} per cm., respectively. Considering only two categories in classing these six types of glass, it is found that the group which has the low index gradients is identical with the group which has low index sensitivity to differences in effective annealing temperature. Apparently there is a significant correlation existing here. The index deviations can not be due entirely to differences in chemical composition, and it may be inferred that more careful annealings will greatly decrease the existing heterogeneities in all of these glasses.

By way of confirmation, Gifford's data on the existing limits of uniformity in optical glass were analyzed in a similar way, and with the same result.

When considering this encouraging prospect for increased uniformity in optical glass, it is well to remember, however, that the index variations now existing over distances of several centimeters in the best glass correspond to differences of only 1°C. or less in effective annealing temperature. Consequently, there are difficult problems in connection with the practical execution of sufficiently iso-thermic annealings. (*Author's abstract.*) Discussed by HEYL, GISH, L. H. ADAMS, and PRIEST.

E. G. ANDERSON, *Colored light measurements on various photometers.*—Four different photometers were used to measure the light transmission of red, orange-amber, green and blue filters. Each of ten observers made two sets of measurements on each filter, the measurements being made on different days. Each observer made from five to ten individual observations in each set of measurements. The average deviations of the individual observations from the observer's mean, for each set of measurements were 3.0, 4.2, 4.5, and 4.5 per cent, respectively, for the Ives-Kingsbury, Flicker, Weber, Martens, and the Standard Lummer-Brodhun photometers. The average deviations of the means of each set of measurements from the mean of the two were 3.1, 5.0, 4.1 and 5.0 per cent respectively, for the photometers named in the same order as above. The results indicate that the measurements on the Weber and Martens might well be adjusted for a normal or average observer by the method of Ives and Crittenden for flicker measurements. The adjustment of the Lummer-Brodhun measurements appear to be less definite. (*Author's abstract.*) Discussed by PRIEST and L. H. ADAMS.

HARLAN W. FISK, *Secular variation of magnetic intensity and its accelerations in Pacific countries.*—Charts showing the lines of equal annual change in the horizontal component of the Earth's magnetic field have been prepared in detail for various parts of the world by investigators in the countries chiefly concerned, but it is difficult to combine these small charts into a chart of the whole Earth, chiefly since they refer to different epochs. World-charts have been prepared, such as that given as an inset on the British Admiralty chart of "Curves of Equal Horizontal Force," but these show the general trend of the changes over large areas, and omit details which the latest observations have disclosed. In a previous discussion the author pointed out that in the Western Hemisphere there are two distinct centers, or "foci," around which the rate of annual decrease of horizontal intensity is large, one of these foci being in southern Argentina, and of greater intensity in the West Indies. Separating these along the Amazon Valley there is a belt within which up to about the year 1917, the horizontal intensity was increasing, but since that date has been decreasing at a low rate in the west, and increasing slightly along the Atlantic coast. Hence the lines of equal annual change of this element on a chart of the Western Hemisphere take the form of two series of

concentric ovals which seem to undergo alternate dilation and contraction, in part but not wholly, in phase with the sunspot cycle.

An analogous condition was found to exist in the Eastern Hemisphere. A negative center (around which the horizontal component is decreasing) exists in western Siberia, but in the southern part of the hemisphere there are two such centers, one of extremely rapid change south of Cape Town, and a second of less intensity west of Australia. In southern India there is a center around which the horizontal intensity is increasing, and which offers especially favorable conditions for investigation because of the number of active observatories in the vicinity. When the mean annual values of horizontal intensity from the reports of an observatory near one of these foci of rapid change have been suitably smoothed and plotted, it is found that the resulting rate-curves are very dissimilar, even for observatories comparatively near together. The contrast is even more striking when the acceleration-curves are compared. The acceleration-curves for Sitka, Honolulu and Christchurch (New Zealand), all of which are remote from foci of rapid change, are very similar and all bear a close resemblance to the smoothed sunspot curve for the same years. When a composite of these three acceleration-curves from such widely separated observatories is plotted, and upon it is superposed a curve made by plotting the departure of the annual sunspot numbers from the mean number for the years under discussion, it is found in general that the accelerations are positive as long as the number of sunspots is greater than the mean number, and becomes negative when the number falls below the mean. This is not in agreement with the widely accepted principle, that the apparent secular rate increases as the number of spots decreases, and *vice versa*.

Acceleration-curves for stations within the area of rapid annual change show other characteristics which seem to be superimposed upon the typical changes which are concurrent with the sunspot cycle and exemplified by the three observatories named. By use of the observatory reports and available field-observations, it was possible to construct the lines of equal annual change around the positive center in the vicinity of Ceylon as they were in 1918. With much less data it was possible to draw the same lines in the positions occupied in 1906. Consideration of the positions occupied by these lines as the center passed from southern China to Ceylon furnishes an explanation of the apparent inconsistencies in the acceleration-curves for neighboring observatories. For illustration, as the center passed very near Toungoo, the annual rate increased very rapidly on its approach and diminished correspondingly as it receded; Barrackpore on the other hand was so situated with respect to the path of the center that it remained between the same two contours, and therefore experienced a very small change in rate. In a similar way the differences in the acceleration and rate-curves for the Soviet observatories near the negative center in western Siberia can be accounted for.

It is probable therefore that these areas within which the annual change of horizontal intensity is large, are undergoing changes of various kinds. There is an alternate expansion and contraction, in phase with the sunspot cycle, and a continual shift of position accompanied by alterations in form. Whether such areas disappear altogether to reappear elsewhere, it is not possible at present to say. That high rates of change should continue in a given locality for long periods is improbable because of the unreasonable distortions in the distribution of the element which would result. For example, the horizontal intensity at Cape Town has diminished by more than 16 per cent in the past 30 years. Should the same rate of decrease be maintained for 150 years more,

that component would vanish, creating the conditions of a magnetic south pole at that place. Whether the movement of these areas on opposite sides of the Earth are in any way connected has not thus far been disclosed, and unfortunately the present means for collecting the data necessary for a satisfactory solution of the problem are far from sufficient. (*Author's abstract*). Discussed by GISH.

OSCAR S. ADAMS, *Recording Secretary.*

ENTOMOLOGICAL SOCIETY

The 412th meeting was held at 8 p.m., Thursday, June 6, 1929, in the National Museum. In the absence of the president and first vice-president, Mr. F. C. BISHOPP, the second vice-president, presided. There were present 29 members and 22 visitors. Mr. FRANK D. DEGANT, Cleveland, Ohio, was elected to membership.

The first feature on the regular program was an informal address by Dr. L. O. HOWARD, entitled *"Observations on some entomologists and their work, during a recent western trip."* He outlined briefly the work being done by a considerable number of entomological workers met by him during his recently completed tour of certain portions of the West. Among these were the entomologists at New Orleans, La.,—HOLLOWAY in his work with sugar cane insects, and BLISS in his investigations of the camphor scale. During the time spent in California inspections were made of the activities of CAMPBELL, STONE, SMITH, TIMBERLAKE, QUAYLE, BOYDEN, and others at Alhambra, Riverside, and various other places in southern California. An auto trip was then taken to San Francisco and Berkeley, where contacts were made with VAN DUZEE, VAN DYKE, BLAISDELL, EVERMANN, HERMS, SEVERIN, STANDLEY, FREEBORN, and others, and inspections were made of the sugar leafhopper work and the recent accessions to the Museum there. While at Berkeley, Dr. Howard received from the University of California the honorary degree of "LL.D" and was guest of honor at a banquet at which over 70 entomologists were present. While in Oregon, inspection was made of the work of MOTE, ATWELL, and others on European earwig, and of ROCKWOOD, REEHER, and others on cereal and forage pests, and while in Washington State with that of KINCADE, HATCH, DOUCETT, SPRIGHT, and others. While en route homeward, stops were made with such State workers as CHAPMAN, RILEY, WILSON, METCALF, FLINT, HAYES, BALDUFF, FRISON, and others at the Universities of Wisconsin, Minnesota, and Illinois. Dr. Howard compared the scope and character of the present day entomological work with that of the limited field and restricted activities of early workers, and had only words of earnest praise for, and appreciation of, the work now being done, and dwelt with hearty enthusiasm upon the prospects for the future in entomological work. A number of slides of the entomologists under consideration were shown. Discussed by BISHOPP, MCINDOO, GAHAN, MORRISON, and ROHWER.

The next feature on the program was an informal address by R. E. SNODGRASS, entitled *"Reviews of some European literature on insect morphology."* This was a brief resume of some of the more important recent items which had come to his attention of entomological literature dealing with morphology. These included certain papers by WEBER, DENIS, MORISON, JACKSON, and UVAROV. Separates of the papers were exhibited. Discussed by HOWARD, CAMPBELL, ROHWER, and BISHOPP.

Dr. WILLIAM SCHAUS reported briefly on the recent accession by the National Museum of the collection of Lepidoptera recently presented by the Brooklyn Museum of Arts and Sciences. He was in Brooklyn from April 8 to 15 packing the collection and making arrangements for its shipment by truck. It contains a considerable number of very valuable types of species described by SMITH, GROTE, HULTZE, HARRY EDWARDS and others. The entire collection comprises over 900 drawers and is valued at over $60,000. It contains, among others, the Nomogan collection valued at $10,000.

The bequest to the National Museum by the late Col. WIRT ROBINSON, of the U. S. Military Academy at West Point, was reported by H. S. BARBER, whose duty it had been to prepare the insect collection for transportation to Washington. Col. Robinson's interest in Natural History had built up a large collection of insects, besides birds and mammals, and he had erected a private museum near his residence overlooking the James River at Wingina, Va., where he had intended to devote his leisure to their study. By his untimely death only three months after retirement and just at the beginning of this long contemplated leisure we have lost the chance of such discoveries as his ardent, experienced industry would surely have made in this neglected section of Virginia. The collection of beetles was arranged in about 150 large drawers and is rich in unstudied material. His great liberality to students resulted in his having no types but original series (probably paratypes) of such of his discoveries as *Arthromacra robinsoni* Leng, *Anthonomus robinsoni* Blatchley, *Piezocorynus virginiae* Leng, *Gyrohypnus davisi* Notman, etc., besides certain very rare forms such as the third known U. S. example of *Enoclerus viduus* (Klug) (synonym, *Clerus jouteli* Leng), are added to the National collection. The occurrence of *Lucanus elaphus* in central Virginia is demonstrated by four males and a female from near Wingina. The bulk of the material was collected by him either near West Point, N. Y., or Wingina, Va., but he also collected in Panama, Jamaica, Cuba, and elsewhere.

Mr. BISHOPP reported that an investigation recently had been started of parasites of reindeer in Alaska, and that Dr. W. E. DOVE had been assigned to the problem, and would sail from Seattle on June 8 for Alaska, where a laboratory would be established at Nome in coöperation with the territorial government and the U. S. Biological Survey, with PALMER at Fairbanks and MILLER at Nome.

J. S. WADE, *Recording Secretary*

Obituary

Rev. FRANCIS ANTHONY TONDORF, S. J., Professor of Physics and Director of the Seismological Observatory at Georgetown University, and a member of the ACADEMY, died on November 29, 1929, at the age of 59 years. He was born in Boston, Mass., and received the degree of A.B. from Woodstock, Md., College in 1895, and Ph. D. from Georgetown in 1914. He was an eminent authority on seismology and related subjects.